

New manifest reflects science's high priority

NASA today issued a new, mixed fleet manifest designating primary payloads for Space Shuttle missions through 1990 and expendable launch vehicles (ELVs) through 1995.

The manifest reflects the high priority assigned to major science payloads. In 1989, five NASA science missions, some with international cooperation, will be launched. Four will fly on the Shuttle.

The four Shuttle missions include

Magellan, which will map Venus with a high-resolution radar, in April; Hubble Space Telescope, one of NASA's highest priorities and a cooperative project with the European Space Agency (ESA), in June; ASTRO-1, a Shuttle-borne ultraviolet observatory, also in June; and Galileo, a cooperative project with Germany to make the first comprehensive survey of Jupiter and its moons, in October.

In addition, the Cosmic Back-

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ground Explorer, a mission to investigate cosmic background noise, is planned for launch on a Delta in February 1989. NASA also will accelerate deployment of other space science missions by fully utilizing ELVs.

For example, the Roentgen Satel-

lite is planned for launch on a Delta in February 1990, and the Extreme Ultraviolet Explorer is planned for launch on a Delta in August 1991.

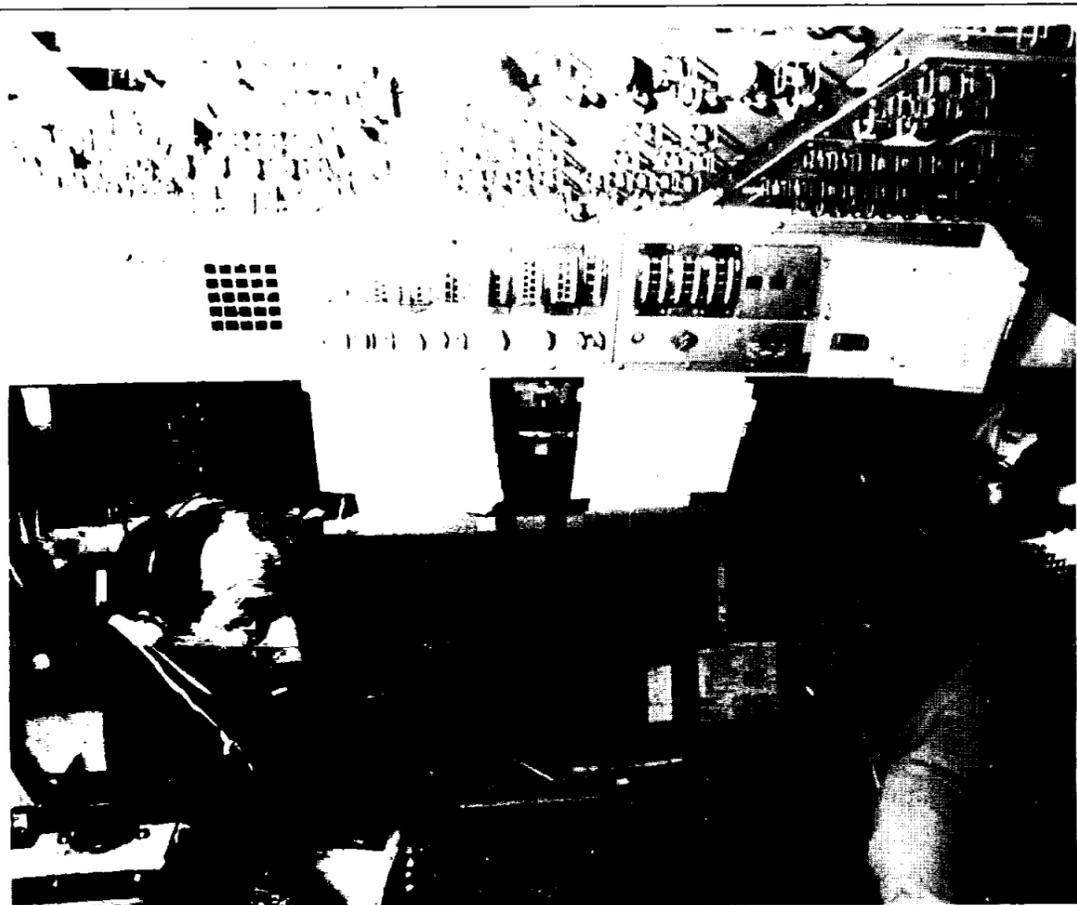
In October 1990, the cooperative ESA/NASA Ulysses mission to observe the polar region of the Sun is scheduled to be launched on the Shuttle.

The reformatted launch schedule includes Space Shuttle missions through STS-44; projected ELV flight assignments; flight histories

for the Shuttle and ELVs; and a summary of payload requests for flight assignments.

Secondary payloads, including some commercial activities, will be added to the launch schedules as they are formally assigned.

A manifest for Space Shuttle flights beyond 1990 will be issued following decisions regarding launch vehicle assignments for certain DOD payloads compatible with both Space Shuttle and ELVs.



Commander Rick Hauck and Pilot Dick Covey prepare for launch in the Bldg. 5 Shuttle Mission Simulator (SMS).

Sim provides plenty of practice

The flight crew for STS-26, along with full teams of flight controllers and support personnel, got plenty of practice for the upcoming mission during a long-duration simulation Oct. 20 through 22.

The exercise was the first long sim for the crew of Rick Hauck, Dick Covey, Mike Lounge, Dave Hilmers and Pinky Nelson, and the second STS-26-type sim for flight controllers this year.

Although the sim was designed to fulfill generic training requirements and not STS-26 training needs, it was another reassuring step in the return to flight

process, said Chuck Shaw, lead flight director.

"It's another chance to prove we're getting closer and closer to flight," Shaw said.

Simulated problems began appearing early as loss of one engine during ascent put Discovery in a lower than intended orbit. Make-believe systems problems kept the flight control teams and crew hopping for two and a half days before the sim ended with a landing at Northrop Strip at White Sands.

In May, the STS-26 crew will participate in a long sim specifically geared to their mission.

JSC campaign goal 10 percent higher

JSC kicked off its 1987 Combined Federal Campaign on Oct. 19, shooting for a 10 percent increase in contributions.

This year's center goal is to raise \$265,000 by Nov. 10.

"I believe that JSC personnel care and it is my sincere hope that you will contribute as liberally as possible to this deserving combined campaign," said JSC Director Aaron Cohen. "It is good to remember that you will not only be helping your community to help itself; you undoubtedly will be helping a

neighbor or loved one when they need it most."

Last year, JSC employees contributed \$238,830 to the total \$1.2 million given by all federal employees in the Houston area. This year, the community's goal is \$50 million, and the goal for all federal employees is \$2 million.

The Combined Federal Campaign (CFC) is a one-time, on-the-job fund-raising campaign for all local, national and international health and welfare organizations recog-

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Cafeteria to shut down for ceiling replacement

All operations in the Bldg. 11 cafeteria will be shut down for about two months beginning in early November so that the ceiling can be replaced.

All employees working in the cafeteria will be either relocated or furloughed. Seventeen employees, chosen on a seniority basis by position, will be placed on furlough without pay.

"We're sorry to have to inconvenience people during the holidays, but these repairs must be made," said Richard Wright, manager of Exchange Operations.

JSC Exchange Store activity will be consolidated in the Bldg. 3 store, Wright said. The Exchange Support Office, with four employees, will be moved into Rms. 201 and 222 of Bldg. 207. Storage and the supervisor's office will be moved to the food preparation area of Bldg. 11, which will not be affected by the

repairs.

The \$400,000 project will involve removal of the existing ceiling and replacement with a suspended acoustical ceiling similar to the ceilings suspended in the majority of JSC buildings. The new acoustical tile will allow easy access to the space above the ceiling and provide sound absorption.

All existing light fixtures and carpet will be cleaned and replaced during the construction period, and the dining area of the cafeteria will be generally refurbished.

In addition, the JSC Credit Union's Pulse machine will be removed. The machine at Bldg. 3 will remain in service. Other minor modifications also will be accomplished during the construction period.

Repairs are expected to be complete and the cafeteria reopened by mid-January.

Main engine, solid rocket motor undergo more tests

Heat exchanger leak found

A leak in Space Shuttle main engine number 2027's heat exchanger, discovered after the third acceptance-test firing on Oct. 10, is being analyzed at NASA's National Space Technology Laboratories in Mississippi.

The engine is now in part two of a tedious six-part leak-isolating process. Early mass spectrometer inspections indicate the leak may be in one of the two hardest-to-inspect portions of the oxidizer heat exchanger. Four more distinct test procedures will be used to continue to isolate the leak.

Engine 2027 was the first of three flight engines being acceptance tested for use on the next Shuttle mission, STS-26. Unless it turns

out to be a condition common to other engines, the problem is not expected to affect the STS-26 launch schedule. The nature of the leak cannot be determined until it is isolated.

If the heat exchanger is deemed unacceptable, the present spare engine, number 2028, will be used to make up the three-engine flight complement. This could entail some engine schedule slippage, but ways to minimize slippage are being investigated.

Initial data following the 520-second test indicated that the engine performed normally, according to test officials from NASA and the Rocketdyne Division of

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Wiper O-ring passes test

Critical O-rings stayed sealed during the most recent test of the Space Shuttle's redesigned solid rocket motor (SRM) nozzle joint in spite of an intentional flaw.

JSC's Rod Lofton, SRM project integration manager, said the Oct. 8 Nozzle Joint Environment Simulator 2-B (NJES 2-B) at Morton Thiokol's Wasatch Operations site in Utah showed that the flaw allowed pressure to reach wiper O-ring closest to the SRM's propellant, but that the O-ring showed no evidence of pressure blow-by, erosion or heat damage.

"All indications point to a successful test," Lofton said.

The major objective of the test, he said, was to evaluate perform-

ance of the fluorocarbon wiper O-ring. To check that performance, a small opening was placed through the polysulfide adhesive that bonds the nozzle insulation to the case insulation. The opening allowed pressure to reach the O-ring.

The test burn lasted six-tenths of a second and pressure was held for 122 seconds, Lofton said. Engineers are continuing to correlate temperature and pressure data from the test with analytical models.

The next SRM test will be the Joint Environment Simulator 3-B test scheduled for Nov. 5.

The next test of the flight configuration for the SRM will be in mid- to late-December when devel-

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People

Public Affairs deputy director appointed
Douglas K. Ward has been appointed deputy director of JSC's Public Affairs Office. Ward, who had been chief of the Media Services Branch since January 1985, will assist the director in development of public affairs plans, policies and procedures, and supervise through channels the Media Services and Public Services Branches. John E. Riley, deputy chief of the Media Services Branch, will serve as acting branch chief.



Douglas Ward

Hispanics recognize astronaut

Dr. Franklin R. Chang-Diaz, the first NASA astronaut of Hispanic-American origin to fly in space, has received the "Medallion of Excellence" from the Congressional Hispanic Caucus Institute. The award is presented annually to two people who have made lasting contributions to improving the quality of life or promoting the interests of Hispanic Americans. The other 1987 recipient was Henry Cisneros, mayor of San Antonio.



Chang-Diaz

Engineering chief receives gold medal

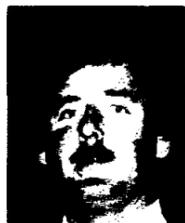
Director of Engineering **Henry O. Pohl** received the Westinghouse Gold Medal of the American Society of Mechanical Engineers during the recent Joint Power Generation Conference in Miami. The medal recognizes Pohl's "outstanding engineering ability, leadership and management skills, evident in the development of the superb propulsion and power systems of United States manned spacecraft." Established in 1952, the medal lauds achievement in the power field of mechanical engineering.



Henry Pohl

Orbital Maneuvering Vehicle manager

Jeffrey G. Williams has been designated NSTS integration and operations project manager for the Orbital Maneuvering Vehicle (OMV). He will continue to serve as payload integration manager and will be responsible for coordination and direction of NSTS budget, compatibility, management and scheduling activities associated with OMV development. He will report to the manager of the Project Development and Integration Office.



Jeffrey Williams

Employees attend UT engineering exposition

Several JSC representatives from the Propulsion and Power and Systems Development and Simulation Divisions recently attended the 8th annual University of Texas Engineering Exposition. The gathering was sponsored by the UT Student Engineering Council and Engineering Career Assistance Center. Attendees included **Michael Le**, **Dorothy Schuster**, **Tom Barrera** and **Diana Villareal**.

New property management group elects officers

A local chapter of the National Property Management Association has been formed at JSC. Elected as officers were **L.R. Whitaker**, president; **Dale Johnson**, vice president; **Pam Lane**, secretary; and **Marge Holmes**, treasurer.

Bulletin Board

Ghosts, goblins to come out for children

Carnival games, prizes, clowns, magic and refreshments will highlight the JSC Employee Activity Association's Children's Halloween Party from 6 to 9 p.m. Saturday, Oct. 31, at the Gilruth Recreation Center. A limited number of tickets—\$3.50 for children and \$1 for adults—will be available at the Bldg. 11 Exchange Store through Oct. 26; no tickets will be sold at the door. For more information, call Susan Starkweather, x36608.

Money management seminar starts in November

Learn how to reduce your taxes, save and invest more and cut insurance costs at a Successful Money Management seminar sponsored by the JSC Employee Activities Association. The 10 1/2-hour course taught by registered investment adviser Martin R. Sabel will meet from 6:30 to 10 p.m. on Tuesdays, Nov. 10 and 17, and Dec. 1, at the Gilruth Recreation Center. Cost is \$35. To register, call x30303. For more information, call Sabel at 358-3188.

Mexican American engineers plan banquet

Donald K. (Deke) Slayton, president of Space Services, Inc., will be the keynote speaker at the Mexican American Engineering Society's fourth annual Scholarship Banquet at 7 p.m., Oct. 29, at the Doubletree Hotel. For reservation and ticket information, call Mrs. C. Perez, 484-3859. For membership information, call Oscar Olszewski, 333-6218.

Inflatable moon habitats to be discussed

Michael Roberts of JSC's Advanced Programs Office will talk about the use of inflatable habitats on the lunar surface at the next Lunch and Learn meeting of the AIAA Houston Section Space Systems Technical Committee. The group will meet from 11:30 a.m. to 12:30 p.m. Tuesday, Oct. 27, in the Bldg. 3 cafeteria. For more information, call Andre Sylvester, x31537, or Michael Laible, 282-2785.

Pascal/C/Modula-2 users plan meeting

The next meeting of the Pascal/C/Modula-2 Users Group will be from 11:30 a.m. to 12:30 p.m. Oct. 26 in Bldg. 30, Rm. 3101. All interested employees are invited. For more information, call Keith Brown, x38952, or John Box, x33349.

Property managers group meets Nov. 19

The local chapter of the National Property Management Association will meet at 4:30 p.m., Nov. 19, at the Gilruth Recreation Center. Dinner begins at 4:30, and business meeting at 5:30 p.m. For more information, call Pam Lane, x36697. For reservations, call Glenda Lancon, x30282.

NASACOMM holds meetings bimonthly

NASACOMM, a Commodore User's Group, holds meetings on the 1st and 3rd Wednesdays of each month at 7:30 p.m. in room 204 at the Gilruth Recreation Center. Anyone with an interest in Commodore computers is invited to attend. For more information, call Bill Moore at 335-6251 or 485-3462.

Supernova models to be examined

Al Jackson of Computer Sciences Corp. will discuss Supernova Models and Supernova 1987 at the JSC Astronomy Seminar from noon to 1 p.m. Wednesday, Oct. 28, in Bldg. 31, Conference Rm. 193. For more information, call Jackson at 280-2296.

Two space conferences coming up

Two important conferences on space are coming to the JSC area in late October and early November.

JSC will host the fourth annual NASA/Contractors Conference on Quality and Productivity here Oct. 27 and 28.

And the 34th annual American Astronautical Society (AAS) Symposium will be in session Nov. 3 through 5 at the Hobby Airport Holiday Inn under the theme "Space—A New Community of Opportunity."

More than 450 aerospace professionals, including a number of government and industry senior executives, are expected to attend the contractors conference. The theme of this year's conference is "Achieving Excellence Through Teamwork."

The keynote speech by NASA Deputy Administrator Dale Myers, luncheon speech by Boeing Company President and Chief Executive Officer Frank A. Shrontz and an evening address by former NASA Administrator James M. Beggs will highlight the first day of the conference.

Participating along with senior industry representatives in conference panel sessions will be NASA Associate Administrators George Rodney, Dr. Raymond Colladay and H. Hollister Cantus. Martin Marietta and IBM, recent recipients of the NASA Excellence Award, will give special presentations on their activities. Astronaut Frederick Hauck, STS-26 commander, will be the second day luncheon speaker.

Thomas O. Paine, chairman of the National Commission on Space and former NASA administrator, will be the featured speaker for the Nov. 4 AAS symposium banquet at the Hobby Airport Holiday Inn.

Paine will receive the AAS Astronautics Literature Award for the commission's report, "Pioneering the Space Frontier."

The symposium—JSC Director Aaron Cohen is executive chairman—will begin at 8:15 a.m. Nov. 3 with a welcome from Houston Mayor Kathy Whitmire and Gerald Griffin, president of the Houston Chamber of Commerce and former JSC director.

For more information about the AAS symposium, call Lockheed-EMSCO at 333-6950.

Brown & Root wins support contract

Brown & Root Services Corp. of Houston has been selected for negotiations leading to award of a contract for Engineering Support Services at JSC.

The cost-plus-award-fee contract is estimated at \$11.7 million for the five-year performance period beginning Dec. 1.

Under terms of the agreement, Brown & Root Services will provide engineering support services includ-

ing facilities engineering and design related to planning, design, development, construction, modification and repair of facilities, including test facilities, process equipment and other systems.

The contract also provides for technical documentation and specifications; inspection and quality control services for the construction, modification and repair of facilities; and modification of space

simulation systems and research equipment and designs.

Work will be performed at JSC and at Ellington Field.

Proposals also were submitted by C.A.P., Houston; Holste & Associates, Houston; Pan Am World Services, Cape Canaveral, Fla.; TCB Project Management, Houston, and Williams-Russell & Johnson, Atlanta, Ga.

Scouts 'ham it up' around the world

By Beverly Green

Airwaves crackled with phrases such as "Hey dude/How are things going?" when the JSC Amateur Radio Club hosted 17 Scouts from three troops for the recent international Jamboree on the Air.

The jamboree is an annual Scouting Amateur Radio event sponsored by the World Organization of the Scout Movement. Often, more than 100 countries are involved.

"Many young people have never been exposed to ham radio and don't even know it exists," said Art Reubens, the club's project manager. "However each scout was given a chance to speak via ham radio," added Reubens, an electromagnetic compatibility engineer at JSC.

The club's "radio shack" near the Gilruth Recreation Center served as headquarters for scouts ranging from ages 11 to 15. Troops 692, 534, and 400 were prepared to "ham it up" between doughnut breaks.

"The scouts were a bit 'mike shy' at first. After the initial hello those suburbanites began speaking a foreign language to the farm belt scouts in Nebraska and Canadian Adventurer Scouts," said Ken Goodwin, a JSC Amateur Radio club member.

In learning to become hams, scouts are able to



Ken Goodwin helps Dennis Heinz of Troop 692 overcome "mike fright" during the recent Jamboree on the Air.

become acquainted with equipment such as lap computers, transmitters, power amplifiers and receivers.

Scouts were provided with the club's QSL cards which are mailed to each contact to verify the communication link. Patches and certificates were also among the awards. Other JSC participants were Scout Master Jim Mangold, John Nickel, Don Noble.

Contributors may designate charity

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nized as tax-exempt by the Internal Revenue Service. It is a cooperative effort between the federal and voluntary sectors that offers federal employees the opportunity to contribute to the charities of their choice.

Contributions made by JSC employees may support any qualified

health or welfare agency in the local six-county area as well as national and international health and service agencies.

Donations may be made through payroll deduction, which start on the first pay period of January 1988 and stop with the last pay period of December 1988. Donations may be directed to specific agencies, and

all employees will receive a list of agencies that received allocations from the local CFC last year. Choices are not limited to those agencies, however, and employees may designate any IRS-recognized charity.

All contributions not designated to specific voluntary agencies will go to the United Way of the Texas Gulf Coast.

'Pristine' motor firing to create data base

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opment motor 9 (DM-9) is fired. An exact date will be announced later.

DM-9 will provide an opportunity to obtain a data base on a "pristine" flight configuration of the SRM, and will not contain any induced flaws. Shuttle program officials are

considering plans for inducing several flaws in a later test motor to help evaluate the SRM redesign's reliability and safety margin.

The test has been rescheduled because of complications encountered in the nozzle fabrication process. Due to those same complications, the SRM flight hardware

probably will be delivered to Kennedy Space Center about two weeks later than originally projected. There appears to be sufficient flexibility in the KSC scheduling system to accommodate the change in the prelaunch processing schedule and still meet the June 1988 launch date for STS-26.

Leak found during routine post-firing check

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Rockwell International. During routine post-firing checkout of the engine, however, indications of a potential leak were discovered in the oxidizer heat exchanger. A leak check on the heat exchanger is performed after every engine test firing.

The heat exchanger consists of

approximately 28 feet of tubing in the exhaust manifold of the high pressure oxidizer turbopump. A portion of the engine's liquid oxygen supply is routed through the heat exchanger coil to convert the liquid oxygen into gaseous oxygen. The gaseous oxygen is used to pressurize the main oxygen supply in the Shuttle's external tank.

The indication of a leak was found by surrounding the heat exchanger tubing with helium, connecting a vacuum pump to the tubing, and using a mass spectrometer to check whether any helium leaked back into the tubing. A series of mass spectrometer tests indicated a low level of leakage was occurring.



Space Shuttle

Flight	Date/ Orbiter	Inclination/ Altitude	Crew/ Duration	Primary Payload	Carrier
26	6/2/88 <i>Discovery</i>	28.5° 160	5 4	TDRS-C	IUS
27	9/8/88 <i>Atlantis</i>	0.0 0	5 0	DOD	
28	12/1/88 <i>Columbia</i>	0.0 0	0 0	DOD	

29	2/2/89 <i>Discovery</i>	28.5° 160	5 4	TDRS-D	IUS
30	4/27/89 <i>Atlantis</i>	28.9° 160	5 4	Magellan	IUS
31	6/1/89 <i>Discovery</i>	28.5° 320	5 5	HST	Unique
32	6/29/89 <i>Columbia</i>	28.5° 190	7 7	ASTRO-1	IG+2 PAL
33	8/24/89 <i>Atlantis</i>	0.0 0	0 0	DOD	
34	10/9/89 <i>Discovery</i>	34.3° 145	5 4	Galileo	IUS
35	11/9/89 <i>Columbia</i>	28.5° 160	5 5	GPS-1 IBSS	PAM-D2 SPAS
36	12/7/89 <i>Atlantis</i>	0.0 0	0 0	DOD	

37	3/1/90 <i>Columbia</i>	28.5° 160	5 5	GPS-2 SYNCOM IV-5	PAM-D2 Unique
38	3/29/90 <i>Discovery</i>	33.4° 175	7 7	STARLAB	LM+1 PAL
39	4/26/90 <i>Atlantis</i>	0.0 0	0 0	DOD	
40	6/4/90 <i>Columbia</i>	28.5° 160	5 4	GRO	
41	7/2/90 <i>Discovery</i>	0.0 0	0 0	DOD	
42	8/2/90 <i>Atlantis</i>	28.5° 160	5 4	TDRS-E	IUS
43	8/31/90 <i>Columbia</i>	28.5° 160	5 7	SKYNET-4A EURECA-1L	PAM-D2
44	10/5/90 <i>Discovery</i>	28.5° 160	5 4	Ulysses	IUS/PAM

Expendables

Date	Launch Vehicle	Orbit	Launch Site	Payload
1/88	Delta 181	LEO	ESMC	DOD-2
2/88	Atlas 63E	SS	WSMC	NOAA-H
3/88	Scout S-206C	LEO	SMR	San Marco-D1
5/88	Scout S-212C	LEO	WFF	ITV-2
8/88	Delta 183	LEO	ESMC	DOD-3
8/88	Scout S-213C	LEO	WSMC	SOOS-3
10/88	Atlas Centaur 68	GSO	ESMC	FLTSATCOM-F8

2/89	Delta 184	SS	WSMC	COBE
2/89	Scout S-214C	LEO	WSMC	SOOS-4
3/89	Atlas 50E	SS	WSMC	NOAA-D
5/89	Scout S-215C	LEO	WFF	ITV-3
8/89	Scout S-210C	LEO	WSMC	NOVA-II

2/90	Delta	LEO	ESMC	ROSAT
2/90	Scout S-218C	LEO	WSMC	TRANSIT-27
3/90	Atlas Centaur	GSO	ESMC	GOES-I
5/90	Scout S-216C	LEO	WFF	ITV-4
6/90	Atlas Centaur	GTO	ESMC	CRRES
6/90	Atlas 34E	SS	WSMC	NOAA-I
8/90	Scout S-211C	LEO	WSMC	TRANSIT-28
12/90	Atlas Centaur	EO	ESMC	GOES-J

Glossary

ASTRO	Ultraviolet Astronomy Telescope	GSO	Geosynchronous Orbit	SAN MARCO	NASA/Italian Earth physics satellite
COBE	Cosmic Background Explorer	GTO	Geosynchronous Transfer Orbit	SMR	San Marco Range
CRRES	Combined Radiation Release Experimental Satellite	HST	Hubble Space Telescope	SOOS	Stacked U.S. Navy Navigation Satellites
DOD	Department of Defense	IBSS	Infrared Background Signature Survey	SS	Sun Synchronous Orbit
EO	Escape Orbit	ITV	Instrumented Test Vehicle	STARLAB	DOD Spacelab
ESMC	Eastern Space and Mission Center	IUS	Inertial Upper Stage	SYNCOM	Hughes Geosynchronous Communication Satellite
EURECA	European Retrievable Carrier	LEO	Low Earth Orbit	TDRS	Tracking Data Relay Satellite
FLTSATCOM	Fleet Communication Satellite	MAGELLAN	Venus radar mapping	TRANSIT	Navy Navigation Satellite
GALILEO	Jupiter probe	NOAA	National Oceanic and Atmospheric Administration	ULYSSES	Formerly International Solar Polar Mission
GOES	Geostationary Operational Environmental Satellite	NOVA	Advanced Navy Navigation Satellite	WFF	Wallops Flight Facility
GPS	Global Positioning System	PAM	Payload Assist Module	WSMC	Western Space and Missile Center
GRO	Gamma Ray Observatory	ROSAT	Roentgen Satellite		

Roundup Swap Shop

All Swap Shop ads must be submitted on a JSC Form 1452. The forms may be obtained from the Forms Office. Deadline for submitting ads is 5 p.m. the first Wednesday after the date of publication. Send ads to Roundup, AP3, or deliver them to the Newsroom, Bldg. 2 Annex, Room 147. No phone in ads will be taken.

Property & Rentals

Lease: Baywind II condo, 1 BR, upstairs, drapes, new carpet, FPL, appliances, W/D, tennis, pool, \$295/mo. Chuck, x35402 or 488-5019 eve.

Sale: 13.5 acres, gently rolling wooded East TX land, front county blacktop, near Tyler and Henderson, assumable low cost Tx. Vet loan. McLeaish, 480-7445.

Lease: Bacliff Villas, 3-1-1a, fenced, hi effi. AC, carpet, refrig., stove, deposit. Ryborn, x30511 or 488-1301.

Lease: 1 BR condo, FPL, W/D, refrig., fan, storage, first floor, corner unit, pool, jogging trail, on lake, \$350/mo., deposit. Angela, 282-3963 or 486-4466.

Sale: 3 mobile homes in small Dickinson park, take over pymts. OBO. Angela, 282-3963 or 486-4466.

Sale: Seascape subdivision, Seabrook 3-2-2 brick, vinyl siding, fenced, new carpet, oven, 1,300 sq. ft. Susan, x36608 or 280-8006.

Lease: El Dorado Way 2-2 condo, split floor plan, W/D, FPL, icemaker, \$410, \$200 deposit. Rick, x36156 or 480-1218.

Lease: Baywind II 2-2.5 townhouse, 2 story, 1,130 sq. ft., FPL, W/D, fans, pool, tennis, \$490/mo. Jeff, x30715 or 280-8608.

Sale: Lake Livingston waterfront, new bulkhead, 110' on water, owner finance possible, Point Blank, TX. Erwin, x35388 or 527-9760.

Lease: University Place 3-2.5-1 townhouse, 1 mi. to NASA, refrig., microwave, W/D, miniblinds, FPL, fans, \$650/mo. David, x32791 or 488-9768.

Sale: Friendswood 5-3.5-2.5, 3,080 sq. ft., both formals, extras, \$142,500. Hal, 482-6638.

Rent: University Trace 2-2 condo, carport, W/D, FPL, security system, wet bar, fans, miniblinds, new paint, close to NASA, \$450, deposit. Jerry, x38173 or 480-8220.

Rent: Mobile home lot, 50 x 120, Dickinson, not in trailer park, all utility hookups, \$65/mo. Finlayson, 333-3446.

Lease: El Dorado Trace 2-2-2 condo, split BR plan, W/D, FPL, appliances, downstairs patio and storage, \$400, deposit. Atkinson, x34319 or 488-1215.

Lease: Lake Livingston waterfront 3-2 house, sleeps 8, furnished, pier, ex. fishing, skiing, swimming. James, x31407 or 482-1582.

Sale: Custom built California-styled 3-2-2, pool, storage, 1 acre, 12 mi. to NASA, no city taxes, priced below appraisal. BO. Bill, 337-2680.

Sale: El Dorado Way condo, 2 BR, no closing cost, no credit needed, will pay buyer \$500 cash at closing. Vicki, x37432 or 480-7212.

Sale: 4 Crystal Beach lots on Bolivar, one or more, each lot 50' x 100', reasonably priced. Anthony, 921-7212.

Sale/lease: '80 mobile home, 14' X 56', Texas A&M, 7 min. to campus, AC, ex. cond., equity and assume \$122/mo. or rent for \$235/mo. Scott, x37115 or 485-4364.

Lease: Baywind II, split design, FPL, W/D, fans, dishwasher, stove, refrig. w/ice maker, \$380/mo., \$200 deposit. Bill Gordon, x35169 or 487-6151.

Sale: League City landscaped 3-2-2 on cul-de-sac, fenced, new paint, extras, ex. cond., low equity and assume FHA fixed \$738/mo., will finance. David, x35464.

Lease: League City, The Landing, 3-2-2, FPL, fans, miniblinds, corner lot, \$550/mo., deposit. Patty, 280-8566 or 554-2305.

Sale: Bellfort/Telephone area, 3-2-2a brick, large lot, formal living room, new carpet, \$58K, new loan or \$4K down on 11 1/8% assumption. Carla, 643-7734.

Lease/purchase: Sycamore Valley 3-2-2, 10 ft. ceilings, large kitchen, fans, extras, \$650/mo. Jay, 484-5676.

Sale: 4-2-2, miniblinds, 3 fans, microwave, 5 miles to JSC, low \$60s, negotiable, must sell by Dec. 1. Roger, x36802 or 334-6866.

Lease: Middlebrook, 3-2-2, fresh paint, FPL, drapes, fenced, near school, ex. cond. Walter, 332-1609.

Lease: Piper's Meadow in Webster, 3-2-2, large open den area, FPL, miniblinds, fenced, ex. cond. Walter, 332-1609.

Lease: El Dorado Way 1-1-1 condo, W/D, appliances, fans, FPL, upstairs, \$300/mo. Joyce, x33148 or 337-3038.

Lease: League City, four-plex unit, 2 BR, W/D, appliances, alarm, storage, covered parking, \$415/mo., deposit. Gordon, x33269 or 481-3787.

Sale: Seabrook/Miramar 3-2-2, formal living room, appliances, near schools and shopping, 10 min. from NASA, \$50,500 or \$4,000 down, \$500/mo. Chuck, x32163 or 470-8377.

Sale/lease: League City/Countryside 3-2-2, big kitchen, \$3,500 down, \$46,000 VA loan, \$613/mo. or lease for \$500/mo. plus deposit. 482-3011.

Sale: Horseshoe Lake Estates.

Romayor, TX., 3-1, AC, furnished, 1 acre, fishing lake, Trinity River, Hwy. 105 between Cleveland and Rye. x33138 or 479-5594.

Sale: Friendswood, 3-2-2, golf course frontage, new roof, quiet cul-de-sac, \$69,000, 482-2154.

Lease: 2-1 condo, 950 sq. ft., W/D, storage, pool, near day care, available immediately, \$330/mo., low deposit. Manisha, 280-9822.

U.S. SAVINGS BONDS

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1-800-US-BONDS



Cars and Trucks

'80 Oldsmobile Regency, new 350 engine, power everything, \$2,775. 326-1722.

'79 Cutlass Cruiser station wagon, 65K mi., new tires, AM/FM, ex. cond. 280-9822.

'74 Porsche 911S, red, new Pirelli P7, AC, 5 speed, ex. cond., records, 9K mi. on engine imported from Germany 6/86, \$12,750. Richard, x31144 or 474-9334.

'85 35' Mallard motor home, low miles, loaded, ex. cond., \$10,000. Long, x32493 or 332-4058.

'80 Buick Regal, 2 dr., V6, 85K mi., good tires, ex. cond. Eddie, x37332 or 480-6058.

'60 Triumph TR3A, classic, rag top, good tires, good cond., ideal for restoration, \$3,000. Eddie, x37332 or 480-6058

'59 Mercedes Benz 220S, \$2,700 OBO. David, x35464.

'77 original short wheelbase step side GMC, totally rebuilt, no smog 454, black, red interior. Gary, 482-4636.

'77 L82 Corvette, T-top, loaded, new motor, transmission, \$6,000. Robin, 282-3392 or 534-2695.

'78 Lincoln Towncar, leather seats, good cond., \$1,100. Huy, 282-3213 or 334-1705.

'85 Z-28, AC, AT, PS, PB, loaded, ex. 650 or 358-6612.

'80 MGB, red, 49K mi., new paint, ex. cond., \$3,800 OBO. Huey, 282-3887 or 748-2726.

'80 Saab 900 GLE, \$1,900 or trade. Al, x32456 or 996-0501.

'84 Honda, 4-dr. LX, 5 spd., PW, cruise, stereo, \$6,950. Chuck, x30092 or 481-3637.

'70 Triumph Trident, collector's item, new chrome, overhauled engine, needs work, \$600. Bob, 282-2022, x412.

'68 Pontiac GTO convertible, 3 dual carbs., \$7,000 OBO. Mike, 333-2335.

'84 GMC Vandura Starcraft Van, 125" wheelbase, blue velour interior, CC, PW, PS, radar detector, cassette w/ equalizer, color TV, ex. cond., \$12,000 OBO. Mike, 333-2335.

'81 Pontiac Grand Prix LJ, T-top, loaded. Wayne, x36617 or 488-8884.

'77 Porsche 924, rebuilt motor, Weber carbs., new brakes, Blaupunkt and amps., BO over \$5,000. David, 554-2992.

'78 Pontiac Bonneville, maroon, red interior; 3.5 HP Chrysler, \$150. James, x37929 or 280-9631.

'63 VW Bus, 15K mi., on rebuilt engine, AM/FM/tape, new parts, ex. cond., \$1,000 OBO. Ralph, x32513 or 532-2304.

Boats & Planes

'85 Wetbike, 60 HP, red, ride double or pull skier. Richard, 488-6526.

'78 SeaRay SRV-195, 190 HP 302 V8, OMC outdrive, mooring cover, running top, tandem axle trailer, low hours, \$5,100. David, 282-5261, 538-1515.

'78 Wellcraft 24' Airstar, twin fresh water-cooled 470 Mercruisers, galvanized trailer, loaded to fish offshore, ex. cond., \$11,500 loan value. Mike, x33280 or 474-4805.

Cycles

'87 Kawasaki Ninja 750R, black, custom German rear sets, extras, BO over \$4,000. David, 554-2992.

Suzuki ALT 125, 3 wheel all-terrain vehicle, new, 5-spd., \$850. Bauch, x31309 or 333-3382.

'76 Kawasaki KZ 900, ex. cond., one

owner, less than 10K mi., \$900. Joe, 480-5130.

'83 Yamaha 750 Virago, 3,500 mi., ex. cond., \$1,400. Donald, 326-3278.

'85 Suzuki GS 700E, 2,375 mi., red and white, new tune-up by Stubbs, ex. shape, \$2,450. John, x36484 or 486-1186.

Audiovisual & Computers

Heath H-89 computer, manuals, software, \$250 or trade. Al, x32456 or 996-0501.

IBM PC-XT, 10MB hard disk, 2 disk drives, PGS color monitor, Panasonic 1092 printer, graphics card, enhanced keyboard, power distribution panel, Wordstar, Dbase II+, Lotus, and other software. Huey, 282-3887.

Apple IIe, 128K enhanced, 2 drives, modem, ton of software, \$700. Gordon, x30518 or 486-4403.

IBM PC XT, 512 RAM, 10MB hard disk, mono monitor w/graphics, 1200B modem, software, \$1,000 OBO. Robert, x39260 or 488-8935.

IBM monochrome/printer card \$45, IBM color graphics card (TV interface incl.) \$45, IBM serial card \$20. Robert, x39260 or 488-8935.

Yamaha CXSM music computer, disk drive, MIDI recorder sequence. Stokes, x38965 or 488-2087.

Commodore 64 computer, color monitor, 2 Commodore 1541 disk drives, BMC printer, computer desk, modem, software, \$950. Will, 282-2808 or 333-5267.

IBM XT compatible PC, 640K, 2 floppies, Taxan color monitor, 1200B modem, Toshiba 1340 letter quality printer, \$1,100. Jeff, x34338 or 943-7754.

Zenith (Heath) H89A computer, 64K memory, single floppy disk drive, 2 serial ports, modem port, CPM operating system, many manuals, \$240. Robert, 554-2476.

Commodore 64 with color monitor, disk drive, software, \$300 OBO. Laurie, 554-6892.

Household

Sears refrigerators, gold, 17.1 cu. double door, frost free, icemaker, \$175; white single door, \$100. 280-7506 or 532-1175.

Dark pecan coffee table, sturdy, 20" x 46" x 16" tall, \$20. Martin, 488-0323.

Sleeper sofa, refrig. 14.3 CF, Kenmore convertible W/D, dinette set, 2 yrs. old. Margaret, x37909 or 930-1509.

Loveseat, 5.5', contemporary, straight line, earth tones, tapestry pattern, \$75. Susan, 488-7633.

Wanted

Want non-smoking car pool rider from Spring High School, hrs. 7 am 3:30 pm. Patnesky, x38636, Panna, x32459 or Decca, 282-3654.

Want roommate(s) to share 3-2 in Friendswood, W/D, cable, microwave, household privileges, non-smokers please, \$245/mo., all bills paid. Michael, x38169 or 482-8496.

Want to buy electric trains. Don, x37832 or 996-1425.

Want ladies wedding band, new or used, prefer large stone, inexpensive. Jim, x30742.

Looking for male roommate for 3 BR home in Nassau Bay, 2 blocks out JSC main gate, \$200/mo. plus utilities, no deposit. John, x31929 or 333-5238.

Male, female or couple to share 3BR house, \$200/mo. plus utilities, 15 min. drive from NASA. Bonnie, x34240 or 538-1147.

Want Nissan Pulsar 84-83 model, good cond. Ken, 473-2602.

Time capsule for my son needs filling, please look for magazines, books or anything else, water bill, speeding ticket, a Corvette, copy of housenote, as close to 10/17/85 as possible. Phil Peterson, 282-3497 or 471-1471.

Want to buy little boys clothes 18 to 24 months, especially coats or jackets. Cheri, x34473 or 489-9250.

Want pistol, good cond., .38 or .357, prefer revolver. Dean, 332-2229.

Need 10 parakeets at the cheapest possible price for study of instinct vs. personality. Becky, 486-1788.

Want female roommate to share large house on 10 acres, horses, children welcome. Barbara, x37714 or (409) 925-7405.

Pets & Livestock

Registered Appaloosa Gelding, 6 yrs. old. Shayla, x30122.

Lost & Found

Lost gold bracelet at Gilruth softball field #1 or tennis courts on Oct. 8. Susan, x32207.

Photographic

Canon G3, f1.7 40 mm lens, auto/manual exposure, Canonlite flash, case, great for novice, \$40 OBO. Dennis, x34405 or 480-5076.

RB67 Pros camera, 90 mm lens, 120 filmback, 220 film back, waist level finder, prism finder, sports finder, deluxe grip, matte box lens shade filters, \$1,350, OBO. Chip, 554-6869.

Musical Instruments

Signet oboe, ex. cond. Amy, x32696 or 480-8845.

Armstrong open hole flute, solid silver head joint, 3 yrs. old, owned by music major, \$500. Phyllis, x30032 or 486-5787.

Clarinet B flat, case, \$75; Yamaha trombone, \$250, case. Mary, 326-2731.

Miscellaneous

Exercise equipment, "Orbit Trac" for lifting weights, sit-ups, \$30 OBO. Sue, 480-5027.

Triple Weber carburetor setup, including manifold, for Datsun Z cars, \$375. Bob, x33048.

Four 15" x 7" universal chrome, 8-spoke rims, ex. cond., \$90; 40-amp. battery charger, new, \$75. Debra, x35256 or 931-1651.

Girl's white roller skates, size 7, ex. cond.; Odyssey TV computer game with cartridges, OBO. Ruby, x38542 or 944-5944.

South Park cemetery lots, Sec. J, lot 39, perpetual care, \$395; Rattan loveseat, walnut, pink floral, ex. cond., \$95. Cookie, x30378 or 474-5610.

T-top sack for '84 Camaro, ex. cond., \$85, OBO; infant wind-up swing, \$15. Cheri, x34473 or 489-9250.

Band saw on stand, 1/3 HP motor VG comp., \$125; antenna rotator model AR-40 w/ electronic control box, \$75; 36" Ridgid pipe wrench, ex. cond., \$40; Craftsman 22" 4 HP self propelled

mower, side bagger, ex. cond., \$125. Anthony, 921-7212.

Moving sale, 10" Craftsman radial arm saw, legset, casters, extra blades, \$250; full-sized canopy French Provincial BR set, \$150; lawnmower, \$75; tiller, \$50; desk, \$10. Jim, 482-8879.

English Bulldog Stud Service, AKC registered, champion, bloodline, healthy, sired by Mapo's Souvenir. Angel, x31384 or 458-7210.

Will trade queen-sized waterbed, headboard, 2 sets of sheets. Nancy, 482-8321.

3-piece early American furniture set, 7 ft. couch, love seat, chair, heavy duty wood frame. Michelle, 337-6394.

4 Pontiac rims w/trim rings, lug nuts, black and silver, 15" x 7", \$50. Bruce, 488-0156.

Serger, white 4-thread super lock, model 504, ex. working cond., \$250; Serger table, \$50. Mary, 326-4175.

Wedding gown, snow white, size 12, long train, solid ruffles, indescribably beautiful. Ruby, 472-6980.

New auto alarm, 12V siren, 6 switches for doors, trunk, hood, key activated, \$30. Dean, 332-2229.

Mint U.S. commemorative stamps (3-18 cents), some duplication, face value, \$50. Jeff, x38312 or 482-5393.

Colt Python, 6" blue, RR & WO, Spring kit, Pachmayr presentation grip, ex. cond., \$475; 6" bench grinder, \$25.

2 Ford Van bench seats, blue vinyl, ex. padding, \$95 ea. or \$175 for both. John, x36484 or 486-1186.

Ward's 5 HP lawn vacuum, heavy duty, good cond., \$150. Dick, 481-1518.

Exercise trampoline for office or home, \$125. Mary, 326-2731.

4' x 6' energy effi. glass, bronze one side, silver other, make great mirrors, was \$300 ea., now \$80 ea. Chip, 554-6869.

Magic Chef 30" chrome gas top, \$15; model 300 Kenmore garbage disposal, \$15; L-K Celebrity stainless steel sink w/faucets, \$15; Whirlpool dishwasher, energy effi., \$15. 482-7156.

Cookin' in the Cafeteria

Week of October 26 — 30, 1987

Monday — Chicken & Rice Soup; Wieners & Sauerkraut, BBQ Ham Steak, Steak Parmesan, Beef & Macaroni (Special); Green Beans, Carrots, Au Gratin Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Tomato Soup; Potato Baked Chicken, BBQ Spare Ribs, Mexican Dinner (Special); Squash, Broccoli, Ranch Beans, Spanish Rice.

Wednesday — Seafood Gumbo; Liver & Onions, Baked Turbot, BBQ Ham Steak, Baked Meatloaf w/Creole Sauce (Special); Beets, Brussels Sprouts, Green Beans, Whipped Potatoes.

Thursday — Beef & Barley Soup; Chicken & Dumplings, Corned Beef w/Cabbage, Smothered Steak w/Cornbread Dressing (Special); Spinach, Cabbage, Cauliflower au Gratin, Parsley Potatoes.

Friday — Seafood Gumbo; Pork Chop w/Yam Rosette, Creole Baked Cod, Tuna & Salmon Croquette (Special); Brussels Sprouts, Green Beans, Buttered Corn, Whipped Potatoes.

Week of November 2 — 6, 1987

Monday — French Onion Soup; Beef Chop Suey, Polish Sausage w/German Potato Salad, Breaded Veal Cutlet (Special); Okra & Tomatoes, Green Peas. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Split Pea Soup; Salisbury Steak, Shrimp Creole, Fried Chicken (Special); Mixed Vegetables, Beets, Whipped Potatoes.

Wednesday — Seafood Gumbo; Fried Catfish w/Hush Puppies, Braised Beef Rib, BBQ Plate, Wieners & Beans, Shrimp Salad, Stuffed Bell Pepper (Special); Corn O'Brian, Rice, Italian Green Beans.

Thursday — Chicken Noodle Soup; Beef Stroganoff, Turkey & Dressing, BBQ Smoked Link (Special); Lima Beans, Buttered Squash, Spanish Rice.

Friday — Seafood Gumbo; Broiled Turbot, Liver & Onions, Fried Shrimp, Meat Sauce & Spaghetti (Special) Green Beans, Buttered Broccoli, Whipped Potatoes.

AT BUILDING #3

On Wednesday we feature The Reuben: Corned Brisket, Swiss Cheese on a bed of Sauerkraut, Poupon Mustard on Rye and 1/4 Pickle. Delicious!

NASA
Lyndon B. Johnson Space Center

Space News Roundup



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